

## Gypsy Moth Management for Homeowners



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Soon, the gypsy moth will become a household word in Tennessee. This obnoxious new neighbor will be eating its way through our hardwood forests, leaving some forests bare.

The gypsy moth is an introduced exotic insect that defoliates hardwood trees, particularly oaks and hickories. Several successive defoliations by the gypsy moth may eventually kill the tree. The gypsy moth has the potential to decimate some older oak forests, similar to the effects of chestnut blight in the early 1900s. The moth was brought to Massachusetts from Europe in 1869 as part of a silk-making experiment. Some larvae escaped, and the moth has now spread from New England through the Appalachian Mountains. The gypsy moth front is presently moving southward from Virginia at the rate of six to 12 miles per year, and will probably reach northeastern Tennessee by the year 2010.

The life cycle of a gypsy moth consists of four stages: egg, larva or caterpillar, pupa or cocoon, and moth (see sidebar). The caterpillar is the stage when gypsy moth feeds on the leaves of the tree. Older larvae, 1/2 to 2 inches long, (Figure 1), feed primarily at night and hide during

the day to avoid predators and parasites. Young larvae chew holes in the leaf, while older larvae consume the entire leaf. When hiding, the larvae usually can be found in cool, dark places near the host tree.



Figure 1. Gypsy moth caterpillars can be identified by their long hairs and red and blue spots.

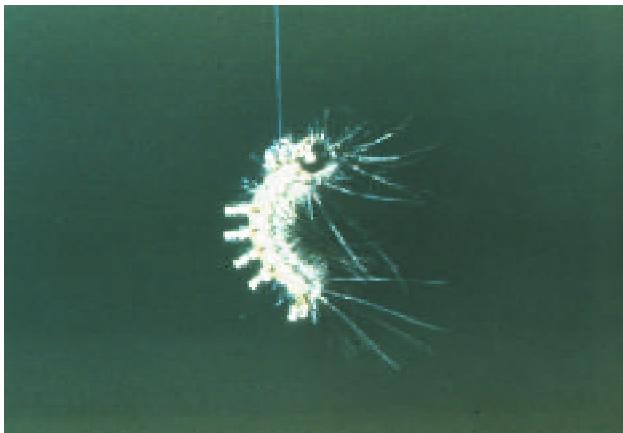


Figure 2. Larva "ballooning" on threadlike strands of silk.



Figure 3. Placing a cloth or burlap band on trees forms a resting place for caterpillars during daylight hours.

Gypsy moths extend the areas of an infestation by “ballooning” (Figure 2). Newly-hatched caterpillars climb to tree crowns, where they hang from strands of their spinned silk until the wind carries them to other trees. Female moths are flightless, so infestations rarely spread more than a few miles each year on their own. However, gypsy moths make long distance moves by “hitchhiking” or laying their eggs on portable objects such as vehicles, mobile homes or lawn furniture that carry them miles away. These small outbreaks should be controlled before populations build to infestation levels.

What can homeowners do to prepare for the gypsy moth’s devastating effects on trees? You can take two integrated approaches to alleviate gypsy moth invasions: (1) control the insect, and (2) improve the growing conditions and health of the trees so they are better able to tolerate gypsy moth defoliations.

## 1. Plant resistant species.

Some tree species are more susceptible to a gypsy moth than others. You can reduce tree damage by planting fewer preferred trees. Diversify the composition of trees and plants on your property to include species the gypsy moth does not prefer (Table 1).

## 2. Improve tree health.

A healthy tree will suffer less long-term damage from the gypsy moth than a weak tree. Weak and old trees are most at risk. Healthy trees can sustain defoliation with minimal damage. Fertilizing and watering trees, as well as pruning all dead limbs, can help trees stay healthy and be less susceptible to defoliation. However, even the healthiest trees may sometimes succumb to repeated defoliations.

## 3. Remove gypsy moth egg-laying and hiding sites.

Remove all unnecessary yard debris: piles of old wood, building materials, dead branches and other refuse. Remove any hiding places on the trees themselves, such as ivy, bark flaps and dead branches.

## 4. Encourage natural enemies of gypsy moth.

Natural enemies of gypsy moth include parasitic insects (wasps and flies), predatory invertebrates (ground beetles, ants, several species of spiders), birds (chickadees, blue jays, nuthatches, towhees, robins, blackbirds, starlings, etc.) and mammals (white-footed mice, shrews, chipmunks, squirrels). Plant ground cover plants, bushes and fruit trees and build bird houses and bird feeders to provide food and homes for these animals.

*Mechanical or chemical procedures to control gypsy moth are:*

### 1. Tree banding.

Tie a burlap strip approximately 18 inches wide around the trunk of the tree approximately 4 to 5 feet above the ground (Figure 3). Fold the burlap strip over the string to form a burlap skirt around the tree. The burlap provides a cool, damp and shady resting area for older caterpillars (more than 3/4 inch long) during the day before they travel up the tree to feed at night. Caterpillars should be removed daily and destroyed in a jar of soapy water. Use forceps or gloves to handle the caterpillars, because their stiff hairs can cause allergic reactions.

A sticky band of material about 5 inches wide can also entrap gypsy moth caterpillars. Wrap duct tape or tar paper

**Table 1. Gypsy Moth Host Preferences.**

**Susceptible:** Species readily eaten by gypsy moth larvae.

Apple, basswood, river and white birch, sweetgum, willow, all oaks, beech, chestnuts, hawthorn, hazelnut, hophornbeam, roses, serviceberry, witch-hazel

**Resistant:** Species fed upon when preferred foliage is not available.

Sweet and yellow birch, blackgum, yellow buckeye, butternut, black cherry, elms, cucumber tree, cottonwood, all hickories, boxelder, maples, hackberry, hornbeam, pear, sassafras, black walnut, hemlock, all pines, all spruces, blueberries, paw paw, chokeberry, persimmon, redbud, sourwood

**Immune:** Species that are rarely fed upon.

All ash, baldcypress, eastern redcedar, balsam and Fraser fir, catalpa, holly, horsechestnut, Kentucky coffee-tree, black and honey locust, mulberry, sycamore, yellow-poplar, spicebush, azaleas, dogwood, elderberry, grape, greenbrier, juniper, rhododendron, mountain laurel, viburnums, silver and striped maples

around the tree and apply a sticky material such as tar, petroleum jelly or grease to the tape. Do not apply these sticky products directly to the bark of the tree. Petroleum-based products can cause swelling and canker on thin-barked trees. Slippery bands of slick plastic are also effective in preventing older caterpillars from re-entering the canopy and causing tree defoliation.

## 2. Removing egg masses.

Scrape off and destroy egg masses. They are frequently found on the bark and crevices of trees (Figure 4), outdoor furniture, eaves of buildings, out buildings, fences, bicycles, rock walls and behind shutters of infested areas. Do not scrape the egg masses on the ground or crush them, because many will survive and hatch in the spring. Soak egg masses in soapy water to destroy them.

## 3. Chemical sprays.

Spray small infested trees less than 25 feet high. Table 2 shows some of the sprays that can be used. *Bacillus thuringiensis (Bt)* is a naturally occurring bacterium that causes death of the caterpillar when ingested. *Bt* is recommended because it only affects moth and butterfly caterpillars and does not affect non-target organisms. *Bt* must be applied to the foliage before the caterpillars are half grown (3/4 inch). Other chemicals can also be used. A good indication of when to spray the trees is when the white oak leaves are 2 inches long or dogwood blossoms are equal to or less than the leaf length. Follow label instructions closely to protect yourself and the environment. Trees greater than 25 feet tall can be sprayed by commercial applicators.

Two biological agents are being investigated as possible controls for gypsy moth. The naturally occurring nucleopolyhedrosis virus, registered as Gypchek, and the parasitic fungus, *Entomophaga maimaiga*, have the po-

Gypsy Moth Activity Calendar						
Caterpillars Present						
Feeding Damage Occurs						
Pupae Present						
Adults Present						
Egg Masses Present						
Destroy Egg Masses						
Apply Pesticides						
Burlap Strips on Trees						
	September to March	April	May	June	July	Aug.

tential to eliminate the gypsy moth caterpillars and have caused the collapse of several populations of gypsy moth.

Although small outbreaks can be controlled, stopping the main infestation of the gypsy moth from spreading into Tennessee is impractical and cost-prohibitive. No practical method exists that will eradicate large populations of the gypsy moth. Although the gypsy moth front may be several years away, management considerations today can be beneficial in making your trees less vulnerable to gypsy moth attack.

**Table 2. Pesticide Options for Gypsy Moth Management in Residential Area.**

Active Ingredient	Representative Trade Name	Remarks
<i>Bacillus thuringiensis (Bt)</i>	Dipel, Thuricide	Registered for aerial and ground use. Available under a variety of trade names. Toxic to other moth and butterfly larvae. Can be safely used near water. Biological pesticide that acts as a stomach poison from naturally occurring bacterium.
Acephate	Orthene	Registered for aerial and ground use. Available under several trade names. Organic phosphate that acts as a stomach poison. Broad spectrum insecticide that is toxic to bees and some gypsy moth parasites. Commonly used from the ground to treat individual trees.
Carbaryl	Sevin	Registered for aerial and ground use. Available under several trade names. Broad spectrum pesticide that is toxic to bees, gypsy moth parasites, and aquatic insects. Carbamate pesticide that acts as a stomach and contact poison.

*Adapted from McManus and others, 1989*



Figure 4. Egg masses are buff colored, firm patches that resemble a piece of chamois cloth. Size ranges from as small as a dime to larger than a quarter.

For further information about the gypsy moth, contact your county Extension office or your local Tennessee Department of Agriculture, Division of Forestry office. The agency primarily involved in state and community-wide control programs is the Tennessee Department of Agri-

#### Further References

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Photographs courtesy of the Tennessee Department of Agriculture.



Figure 5. Pheromone moth trap stapled to tree to detect new infestations.

culture. Any information about gypsy moth should be reported to the Division of Regulatory Services, P.O. Box 40627, Melrose Station, Nashville, TN 37204; telephone: (615) 837-5130.

#### Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

#### Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be cancelled, it would no longer be recommended by The University of Tennessee.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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